

WHAT IS CLAIMED IS:

1. An optical data storage device comprising:
a substrate having oppositely facing first and second surfaces;
a first metal/alloy layer overlaying the first surface of the substrate, wherein the
first metal/alloy layer comprises tin, antimony and an element selected
from the group consisting of indium, germanium, aluminum, and zinc,
and;
a first dielectric layer overlaying the first metal/alloy layer, wherein the first
dielectric layer comprises silicon oxynitride, wherein the first metal/alloy
layer is positioned between the substrate and the first dielectric layer .

2. The optical data storage device of claim 1 further comprising:
a second metal/alloy layer overlaying the second surface of the substrate, wherein
the second metal/alloy layer comprises tin, antimony and an element
selected from the group consisting of indium, germanium, aluminum, and
zinc, and;
a second dielectric layer overlaying the second metal/alloy layer, wherein the
second dielectric layer comprises silicon oxynitride, wherein the second
metal/alloy layer is positioned between the substrate and the second
dielectric layer.

3. The optical data storage device of claim 1 wherein the first metal/alloy
layer has a cross-sectional thickness between 40nm and 125nm.

4. The optical data storage device of claim 1 wherein the first dielectric layer
has a cross-sectional thickness between 20nm and 120nm.

1 5. The optical data storage device of claim 1 wherein the first dielectric layer
2 has a cross-sectional thickness of approximately 60nm and the first metal/alloy layer has
3 a cross-sectional thickness of approximately 85nm.

1 6. The optical data storage device of claim 1 wherein the substrate comprises
2 a rigid material.

1 7. The optical data storage device of claim 1 wherein the metal/alloy layer
2 comprises $\text{Sb}_{70}\text{Sn}_{15}\text{In}_{15}$.

1 8. The optical data storage device of claim 1 wherein the first metal/alloy
2 layer is formed using a sputtering technique.

1 9. The optical data storage device of claim 1 wherein the first metal/alloy
2 layer is formed using a vapor deposition technique.

1 10. The optical data storage device of claim 1 wherein a real part of refractive
2 index for the first dielectric layer is between 1.4 and 2.0.

1 11. The optical data storage device of claim 1 wherein the first surface of the
2 substrate is grooved, wherein grooves of the first surface define raised surface portions,
3 recessed surface portions, and side walls therebetween.

1 12. The optical data storage device of claim 1 wherein the first metal/alloy
2 layer comprises a grooved surface, wherein grooves of the first metal/alloy layer define
3 raised surface portions, recessed surface portions, and side walls therebetween, wherein
4 the raised surface portions are configured to store optical data.

1 13. A method comprising:
2 forming a first metal/alloy layer overlaying a first surface of a substrate wherein
3 the first metal/alloy layer comprises tin, antimony and an element selected
4 from the group consisting of indium, germanium, aluminum, and zinc,
5 and;
6 forming a first dielectric layer overlaying the first metal/alloy layer, wherein the
7 first dielectric layer comprises silicon oxynitride, wherein the first
8 metal/alloy layer is positioned between the substrate and the first dielectric
9 layer.

1 14. The method of claim 13 further comprising:
2 forming a second metal/alloy layer overlaying a second surface of the substrate,
3 wherein the second metal/alloy layer comprises tin, antimony and an
4 element selected from the group consisting of indium, germanium,
5 aluminum, and zinc, and;
6 forming a second dielectric layer overlaying the second metal/alloy layer, wherein
7 the second dielectric layer comprises silicon oxynitride, wherein the
8 second metal/alloy layer is positioned between the substrate and the
9 second dielectric layer.

1 15. The method of claim 13 wherein the first metal/alloy layer has a cross-
2 sectional thickness between 40nm and 125nm.

1 16. The method of claim 13 wherein the first dielectric layer has a cross-
2 sectional thickness between 20nm and 120nm.

1 17. The method of claim 13 wherein the substrate comprises a rigid material.

1 18. The method of claim 13 wherein the metal/alloy layer comprises
2 $\text{Sb}_{70}\text{Sn}_{15}\text{In}_{15}$.

1 19. The method of claim 13 wherein the first metal/alloy layer is formed using
2 a sputtering technique.

1 20. The method of claim 13 wherein a real part of refractive index for the first
2 dielectric layer is between 1.4 and 2.0.

1 21. An optical data storage device comprising:
2 a substrate having oppositely facing first and second surfaces;
3 a first metal/alloy layer overlaying the first surface of the substrate, wherein the
4 first metal/alloy layer comprises tin, antimony and indium, and;
5 a first dielectric layer overlaying the first metal/alloy layer, wherein the first
6 dielectric layer comprises silicon oxynitride, wherein the first metal/alloy
7 layer is positioned between the substrate and the first dielectric layer .